A. **Building Code**

1. The design and construction shall conform to the **2018** International Building Code (IBC) as amended by the City of Lee's Summit, Missouri.

B. **Design Loads**

1. This project is designed to resist the most critical loads resulting from the basic load combinations outlined in section 1605 of the code.

2. Dead Loads
   a. The roof mounted equipment weights used for design are indicated on the contract documents. The Contractor shall submit actual weights for all roof mounted equipment for review by the Engineer.

3. Wind - The wind load is in accordance with ASCE 7 with the following criteria:

a.	Basic wind speed	V3S=117 mph
b.	Allowable Stress Design Wind Speed	91 mph
c.	Risk Category	III
d.	Exposure Catergory	C
e.	Components & Cladding Force	per code

4. Seismic - The seismic design is in accordance with the general building code with the following criteria:

a.	Importance Factor	IE=1.25
b.	Risk Category	III
c.	0.2 sec Spectral Response Acceleration	Ss=9.9%
d.	1.0 sec Spectral Response Acceleration	S1=6.8%
e.	Soil Site Class	D
f.	Design 0.2sec Spectral Response Acceleration	Sds=10.5%
g.	Design 1.0sec Spectral Response Acceleration	Sd1=10.9%
h.	Seismic Design Category	B
i.	Basic Seismic Force Resisting System	Steel systems not specifically detailed for seismic resistance

C. **Structural Steel**

1. All steel fabrication and erection shall be in accordance with the requirements and recommendations of the American Institute of Steel Construction (AISC) Code of Standard Practice for Steel Buildings and Bridges, Latest Edition.
   a. Steel design shall be per Allowable Stress Design as outlined by AISC.

2. Grade
   a. Steel W and WT-shapes ASTM A992 or ASTM A572, Gr. 50
   b. Channels, angles and plates ASTM A36
   c. Square hollow structural shapes ASTM A500, Grade C (50 ksi)
   d. Round hollow structural shapes ASTM A500, Grade C (46 ksi)
   e. Connection material ASTM A36

3. Connections
   a. All steel connection design shall be in accordance with the requirements of the AISC Specification for Structural Steel Buildings and Specification for Structural Joints Using High-Strength Bolts.
   b. Connection design shall be based on reactions listed on the drawings and specifications. Minimum connection design shall be 15k shear and 5k axial unless noted otherwise. All gravity and lateral loads noted in the drawings are service level loads.
   c. All bolted lateral bracing connections (beams, columns, and bracing) shall be designed as slip critical connections.
   d. It is the preference of the Engineer of record to have shop welded, field bolted connections unless shown otherwise on the drawings.
   e. Design calculations sealed by a professional engineer licensed to practice in the jurisdiction where the project is located shall be submitted for the architect/engineer record. Calculations shall be well organized and indexed.
   f. Field welding shall be performed by a qualified welder and conform to the latest publication of applicable codes set forth by the American Welding Society. Welding electrodes shall be E70XX.

4. Thermal cutting is not allowed in the field.

5. The contractor shall supply all miscellaneous steel as required by the contract documents. Miscellaneous steel shall include, but is not limited to, shelf angle, glass support, lintels, catwalks and other steel required for stabilization of architectural elements.

6. The Contractor shall provide an additional allowance of 2% of the steel bid (includes specification sections 051200, 052100, 053100, 055000) for steel material, fabrication and erection to be used at the direction of the Structural Engineer. Any unused portion of the allowance shall be returned to the owner.

D. **Open Web Joist**

1. Open web steel joist shall be designed, fabricated and erected in accordance with the latest recommendations of Steel Joist Institute (SJI).

2. Following are the minimum end bearing and weld requirements when an open web steel joist bears on structural steel:
   a. K-series - 2 ½" bearing with a 1/8"x2" fillet weld each side of the joist seat.
   b. LH-series - 4" bearing with a 1/4"x2½" fillet weld each side of the joist seat.

3. All joists have been selected based on the uniform dead and live loads noted in section B.2 and B.3 above. All additional loads shown on the plans (Mechanical equipment, basketball goals, etc.) shall be added to the uniform live load. All snow drift loads shall be included in the appropriate code load combinations.

4. Following are the minimum end bearing requirements when an open web steel joist bears on load bearing CMU:
   a. K-series - 4" bearing on an embed plate located not more than ½" from the face of the wall. Weld the joist to the embed plate with a 1/8"x2" fillet weld each side of the joist seat.
   b. LH/DLH-series - 4" bearing on an embed plate located not more than ½" from the face of the wall. Weld the joist to the embed plate with a 1/4"x2½" fillet weld each side of the joist seat.

5. All joists, joist girders and joist accessories shall be designed for a net uplift of 13 psf in the corners, 10 psf at the edges and 8 psf in the field of the building. Edge zone = 10 feet.

6. All roof bar joists shall be designed for uplift as stipulated by the applicable building code. Extra bracing shall be added as required, and the joist manufacturer shall certify that the joists have been designed for reverse bending due to uplift.

7. All bar joists shall have horizontal bridging as recommended by the Steel Joist Institute. Provide rigid "X" bridging in addition to horizontal bridging where horizontal bridging is discontinuous, unless horizontal bridging is connected to a wall top and bottom of joist. The erector shall follow the latest requirements of the Steel Joist Institute regarding additional bolted "X" bridging required for erection stability.

8. All hangers supporting pipe, equipment, conduit, etc. of more than 200 lbs. supported from steel bar joists or joist girders shall be hung from top chords and within 2" of web panel points. If interferences exist that will not allow pipe to be hung in this manner, the contractor shall notify the engineer for required modifications.

E. **Steel Deck**

1. Crimped or button punched side lap fastening is not allowed for any roof deck or floor deck.

F. **Cold Formed Steel**

1. All cold formed steel framing shall be designed, fabricated and erected in accordance with the recommendations of latest edition of the American Iron and Steel Institute (AISI) Specification.

2. All cold formed steel indicated in these contract documents have been referenced by the Steel Stud Manufacturers Association (SSMA) nomenclature.

3. Wall bridging shall be installed at 4'-0" OC maximum.

4. Top and bottom tracks shall match the wall stud thickness and depth.

5. All welding shall conform to latest AWS D1.3.

6. Pre-drill holes for all screws which are not self-tapping.

7. All lapped, screwed connections shall be made with a minimum of (4) #12 screws or the equivalent weld unless noted otherwise.

8. All screwed connections shall provide for a minimum of ½" edge distance and spacing. All screws shall be completely installed such that the plies of metal being connected are tight to one another.

9. All floor and roof framing shall align with the wall stud below.

10. Joist blocking shall be spaced at 8'-0" OC maximum.

11. Composite design of sheathing and wall studs is not allowed.

12. All framing members shall be cut square such that they fit tight at all perpendicular connections.

13. Field splices of structural cold formed members are not allowed.

G. **Miscellaneous**

1. Periodic site observation by field representatives of Hollis and Miller Architects, if provided, is solely for the purpose of determining if the work of the contractor is proceeding in general accordance with the structural contract documents. This limited site observation should not be construed as exhaustive or continuous to check the quality or quantity of the work, but rather periodic in an effort to guard the owner against defects or deficiencies in the work of the contractor. Observations by the engineer shall not be considered inspections, and in no way relieves the contractor of any requirements of the contract documents.

2. The building is not structurally stable until all connections, framing, shearwalls, permanent bracing, metal decking, and exterior load bearing walls (where applicable) are complete and have achieved their design strength. Contractor is solely responsible for maintaining structural stability during erection and construction. Temporary bracing systems are not to be removed until structural work is complete.

3. The contractor shall not alter or modify work shown on the structural drawings without receiving written approval from the engineer. When conflicts occur between the drawings and specifications, the strictest interpretation shall govern.

4. The contract structural drawings and specifications represent the finished structure, and except where specifically shown, do not indicate the method or means of construction. The contractor shall supervise and direct the work and shall be solely responsible for all construction means, methods, procedures, techniques, sequence, and safety precautions and programs. The engineer will not be responsible for the acts or omission of the contractor, subcontractor, or any other persons performing any of the work, or for the failure of any of them to carry out the work in accordance with the contract documents.

5. See architectural, mechanical, electrical, and plumbing drawings for other pertinent information related to the structural work and coordinate as required. These structural drawings are intended to be utilized as a complete set of documents that represent the building's structural systems. No single sheet or series of sheets is intended to "stand alone". Typical details may or may not be cut at specific locations throughout the drawings, but are to be applied where required. These structural drawings are intended to be included in a complete set of construction documents, including but not limited to, architectural drawings, civil drawings, and mechanical/electrical/plumbing drawings. Contractor shall verify coordination of these drawings with contents of above sets specified and only proceed with bidding and construction after such has taken place.

6. All existing field and building conditions shall be verified by the Contractor before any other work shall begin. Coordinate with Engineer of Record regarding any discrepancy with existing building dimensions.

7. Submittals
   a. Submittals are to be based upon the latest submitted contract documents. This includes all addendums, Architectural Supplemental Instructions (ASIs), Structural Supplemental Drawings (SSD's), and Requests for Information (RFI's).
   b. Submittals shall be original documents. Shop drawings shall not be a duplication, in any way,of the contract documents. This includes, but is not limited to, photocopies, electronic drawing copying or electronic scanning. Any submitted shop drawing that is not original will be rejected and returned without review.
   c. Prior to submission of the submittals to the Architect, the Contractor shall review the shop drawings for conformance to the means, methods, techniques, sequences and operations of construction. The Contractor's review stamp shall be affixed to all shop drawings prior to Architect or Structural Engineer review. Shop drawings not bearing the Contractor's review stamp will be returned without review.
   d. Design Calculations - All calculations shall be signed and sealed by a professional engineer licensed in the State of the project. Provide the following design calculations for review:
      1. Structural Steel connections
      2. Cold formed steel framing - exterior wall and load bearing
   e. Submittals - Provide the following submittals for review:
      1. Structural Steel
      2. Miscellaneous Steel including lintels, stairs, etc.
      3. Open Web Steel Joist
      4. Metal Deck
   f. Substitutions are allowed prior to bid only. Reference the specifications for timing of submission

H. **Special Inspections (based on 2018 IBC, Chapter 1704)**

1. Special inspection reports shall be submitted to the Building Official, Owner, Architect, Engineer, Contractor, Sub-Contractor and any other pertinent entity in a timely manner.

2. All discrepancies found by the special inspector shall immediately be brought to the attention of the general contractor and corrected. If the contractor is unable to correct the discrepancy, the special inspector shall notify the Architect and Engineer.

3. Upon completion of the project, the special inspector shall submit a final report delineating that the work was, to the best of the inspector's knowledge, completed in conformance with the approved contract documents and applicable building code.

4. The Owner shall retain special inspection services for the items listed below. The Contractor shall provide light general labor as required to assist with special inspections.

5. Steel (includes structural steel, joist, deck and anchor rod placement)
   a. Periodic
      1. Single-pass fillet welds not exceeding 5/16 inch in size.
      2. Floor and roof deck attachment
      3. Headed stud anchors
      4. Welding of stairs and railing systems
      5. High strength bolts
   b. Continuous
      1. Partial and full penetration welds.
      2. All other welding not covered in periodic inspections.

ABBREVIATIONS

A

AFF	above finish floor
ADDL	additional
ALT	alternate
ARCH	architect
AR	anchor rod

B

BLDG	building
BM	beam
BOT	bottom
BRG	bearing
BTWN	between

C

C	compression
CANT	cantilever
CL	center line
CLR	clear
CIP	cast in place
CJ	control joint
CJP	complete joint penetration
COL	column
CMU	concrete masonry unit
CONC	concrete
CONN	connection
CONTR	contractor
CONST JT	construction joint
CONT	continuous

D

D	dead load
db	bar diameter
DBA	deformed bar anchor
DLT	detail
DIA	diameter
DIM	dimension
DN	down
DWG	drawing
DWL	dowel

E

E	seismic load
EA	each
EF	each face
EM	modulus of elasticity
EXP JT	expansion joint
ELEV	elevation
ENGR	engineer
EQ	equal
EW	each way
EXIST	existing
EXT	exterior

F

FB	field bend
FD	floor drain
FF	finish floor
FIN	finish
FND	foundation
FLR	floor
FTG	footing
FS	far side
FV	field verify

G

GA	gauge
GB	grade beam
GALV	galvanized

H

H	horizontal shear
HORZ	horizontal
HSA	headed stud anchor
HT	height

I

IF	inside face
INT	interior

J

JST	joist
JT	joint

K

K	kip (1000 lbs)
KSF	kips per square foot
KSI	kips per square inch

L

L	live load
LBS	pounds
ld	development length
LLBB	long leg back to back
LLH	long leg horizontal
LLV	long leg vertical
LWT	light weight

M

M	strong axis moment
MAX	maximum
MECH	mechanical
MEP	mechanical/electrical/plumbing
MEZZ	mezzanine
MFR	manufacturer
MIN	minimum
MIR	mirror
MISC	miscellaneous

N

NIC	not in contract
NS	near side
NTS	not to scale
NWT	normal weight

O

OF	outside face
OC	on center
OPNG	opening
OPP	opposite

P

P	axial load
PAF	powder actuated fastener
PC	precast
PCF	pounds per cubic foot
PL	plate
PLF	pounds per linear foot
PSF	pounds per square foot
PSI	pounds per square inch
PT	point

R

R	radius
RE	reference
REINF	reinforcement or reinforcing
REQD	required
REV	revision
RTU	roof top unit

S

S	snow load
SC	slip critical
SCHED	schedule
SECT	section
SHT	sheet
SIM	similar
SPA	spacing
SPEC	specification
SQ	square
STD	standard
STIF	stiffner
STL	steel
SYM	symmetrical

T

t	thickness
T	tension
THRD	threaded rod
TO	top of
TOC	top of concrete
TOM	top of masnry
TOS	top of steel
TOW	top of wall
TYP	typical

U

UNO	unless noted otherwise

V

V	vertical shear
VAR	varies
VERT	vertical

W

W/	with
W	wind load
WDL	nominal dead load
WLL	nominal live load
WP	work point
WSL	nominal snow load
WT	weight
WWR	welded wire reinforcing

Y

YD	cubic yard

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MCC Longview Community College Lab Refresh
Metropolitan Community College
500 SW Longview Road,
Lees Summit, MO - 64081

100% Construction Documents

REVISIONS:

#	Description	Date

STATE OF MISSOURI
MICHAEL JOEL VALENTINE
NUMBER
PROFESSIONAL ENGINEER
12-17-2021

JOB NO: 21004.60
DRAWN BY: JLB
CHECKED BY: HCJ
DATE: 12/17/2021

S001

GENERAL NOTES & SPECIAL INSPECTIONS

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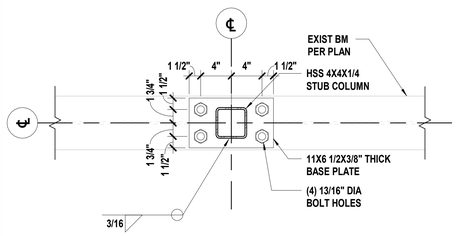
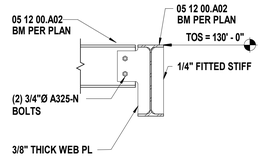
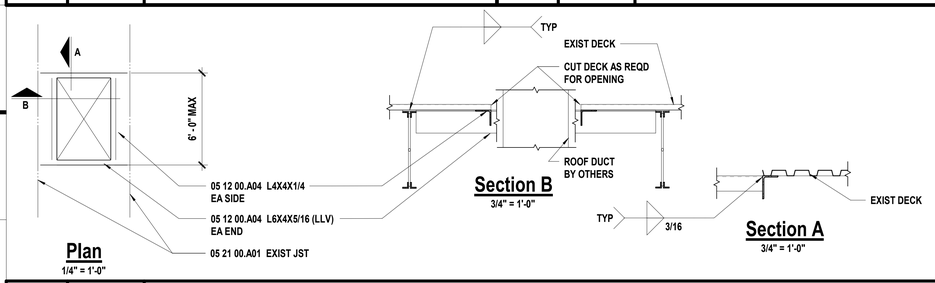


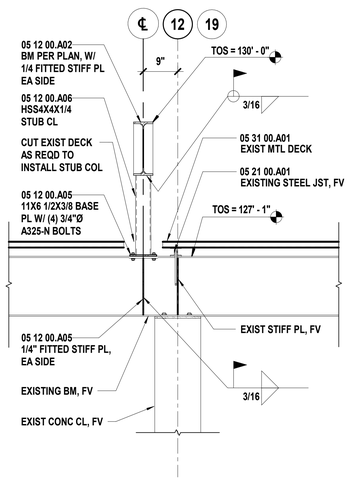
P1 | Scale: 1 1/2" = 1'-0" | Base Plate Detail



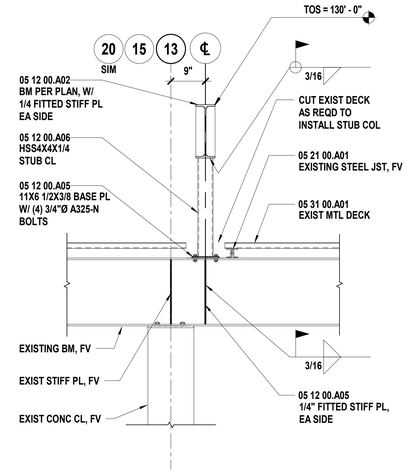
P5 | Scale: 1" = 1'-0" | Beam to Beam Connection



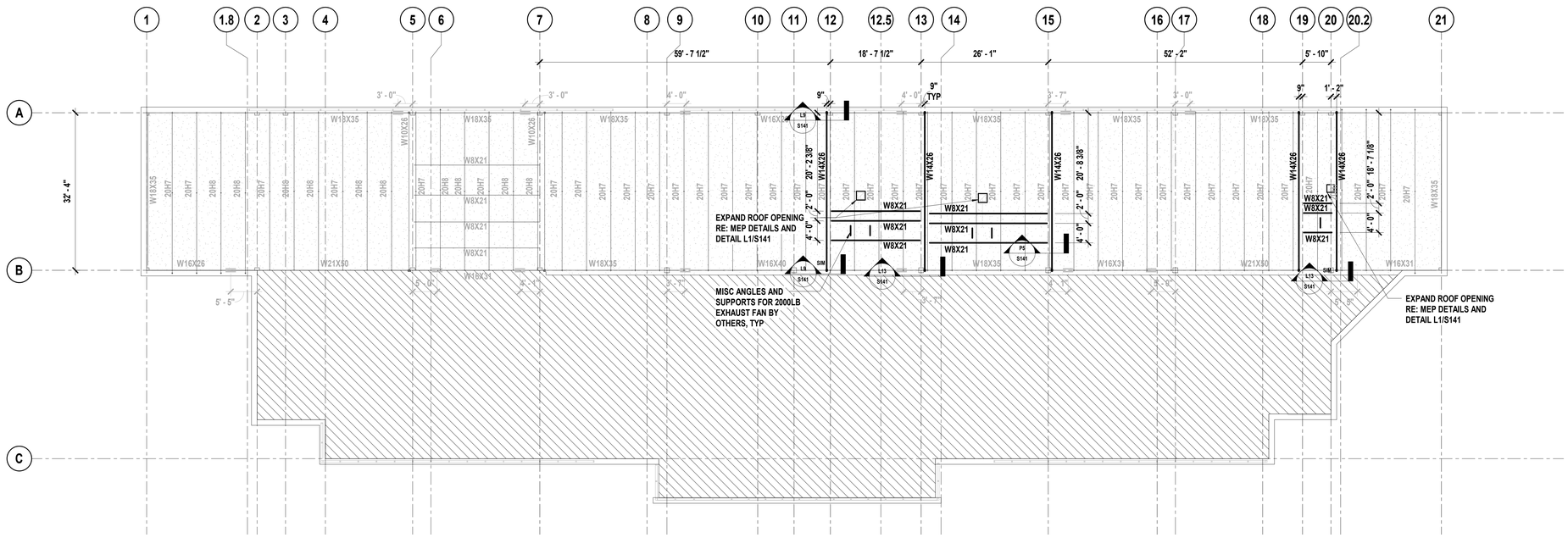
L1 | Scale: 1/4" = 1'-0" | Typical Roof Opening Framing - Plan



L9 | Scale: 3/4" = 1'-0" | Connection Detail



L13 | Scale: 3/4" = 1'-0" | Connection Detail



BEAM LEGEND

BEAM END REACTIONS (NOMINAL LOAD), SEE BELOW

BEAM SIZE

DENOTES BRACE FRAME (SEE S365)

30 Kips W24x55

(COMPOSITE, CAMBER)

M50
P20
H20

V=VERTICAL SHEAR (kips)
M=STRONG-AXIS MOMENT (kip-ft)
P=BEAM AXIAL LOAD (kips)
H=HORIZONTAL SHEAR (kips)

A1 | Scale: 3/32" = 1'-0" | Roof - Dunnage Frame Layout 3 Locations

NORTH

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100% Construction Documents

REVISIONS:

#	Description	Date

STATE OF MISSOURI
MICHAEL JOEL VALENTINE
PE-2010035868
PROFESSIONAL ENGINEER
12-17-2021

JOB NO: 21004.60
DRAWN BY: JLB
CHECKED BY: HCJ
DATE: 12/17/2021

S141

ROOF FRAMING PLAN - OVERALL

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